

Mercury Deposition Network

Summary of Available MDN Data, 1996-2001

Prepared for:

Great Lakes Binational Toxics Strategy
Mercury Workgroup Meeting

Windsor, Ontario Canada

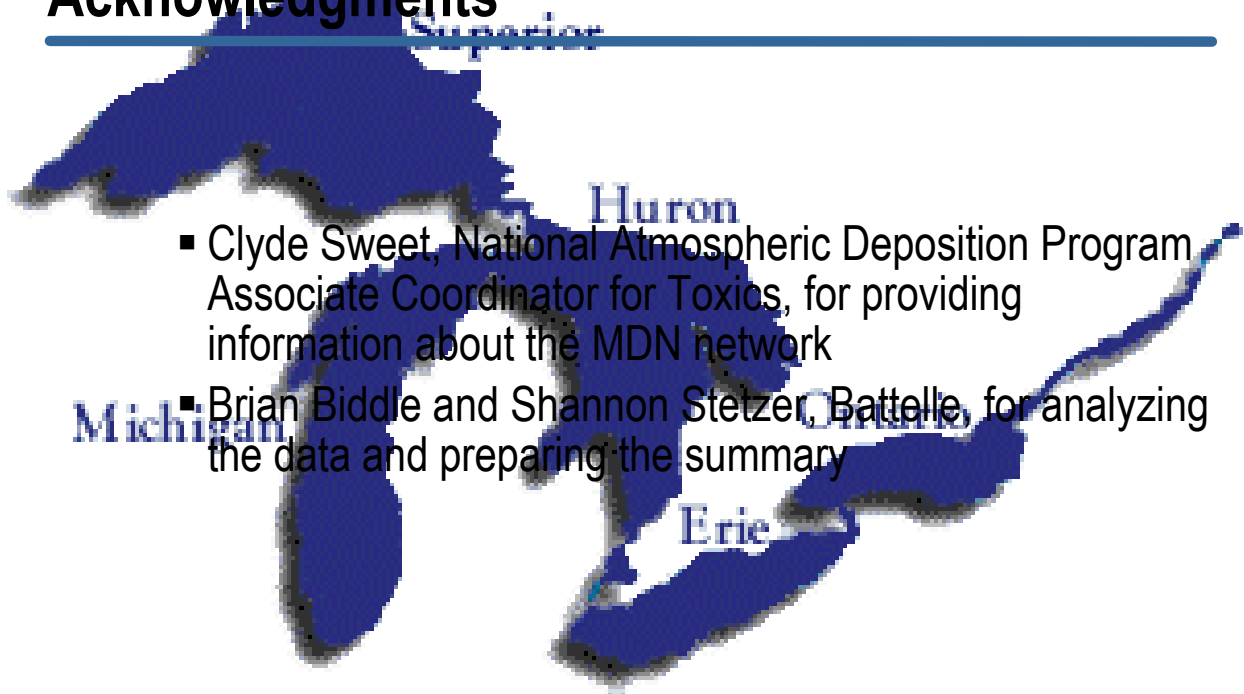
May 14, 2003

presented by:

Amy Thomas, Battelle



Acknowledgments



- Clyde Sweet, National Atmospheric Deposition Program Associate Coordinator for Toxics, for providing information about the MDN network
- Brian Biddle and Shannon Stetzer, Battelle, for analyzing the data and preparing the summary

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Outline of the Presentation

- MDN Background
- Source of Data
- Data Limitations
- Data Summary (tables, charts, maps)

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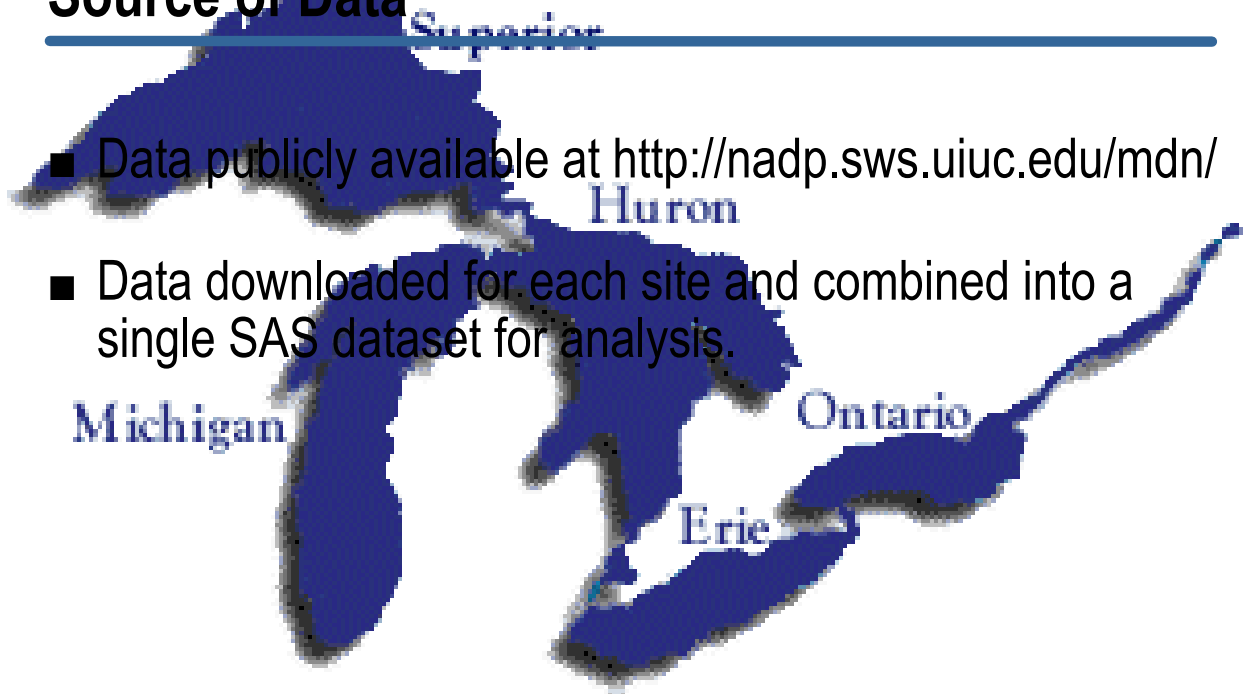
MDN Background

- Weekly concentrations of total mercury in precipitation
- Information on spatial and seasonal trends in mercury deposited to sensitive receptors (e.g., surface waters)
- Originated in 1995 with 13 sites, 26 sites in 1996, over 50 sites operating during 2000, 73 active sites today
- Managed at the NADP Coordination Office (many collaborating Federal, State, & Local agencies)

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Source of Data

- Data publicly available at <http://nadp.sws.uiuc.edu/mdn/>
- Data downloaded for each site and combined into a single SAS dataset for analysis.



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Data Limitations

- Site location limits spatial analysis
 - Not probability based, majority in eastern U.S., tend to represent rural locations
- Age of network limits temporal trends assessment
 - Less than 20 sites have >5 years of data
- No dry deposition measurements
- Limited data on methylmercury (monitoring is optional)

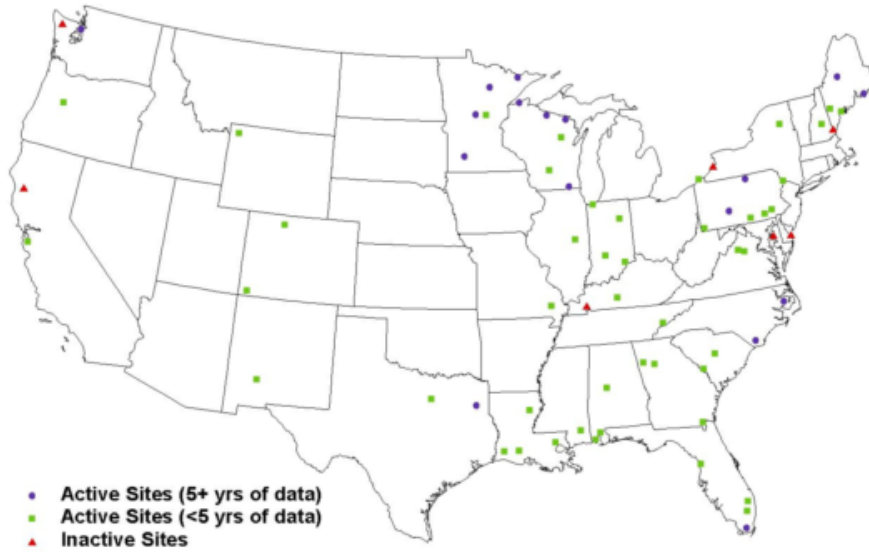
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Number of MDN Sites and Years of Data

Years of Data ¹	Number of MDN Sites	
	Active (n=73)	Inactive (n=9)
< 1	21	6
1	15	2
2	4	1
3	8	0
4	6	0
5	14	0
6	5	0

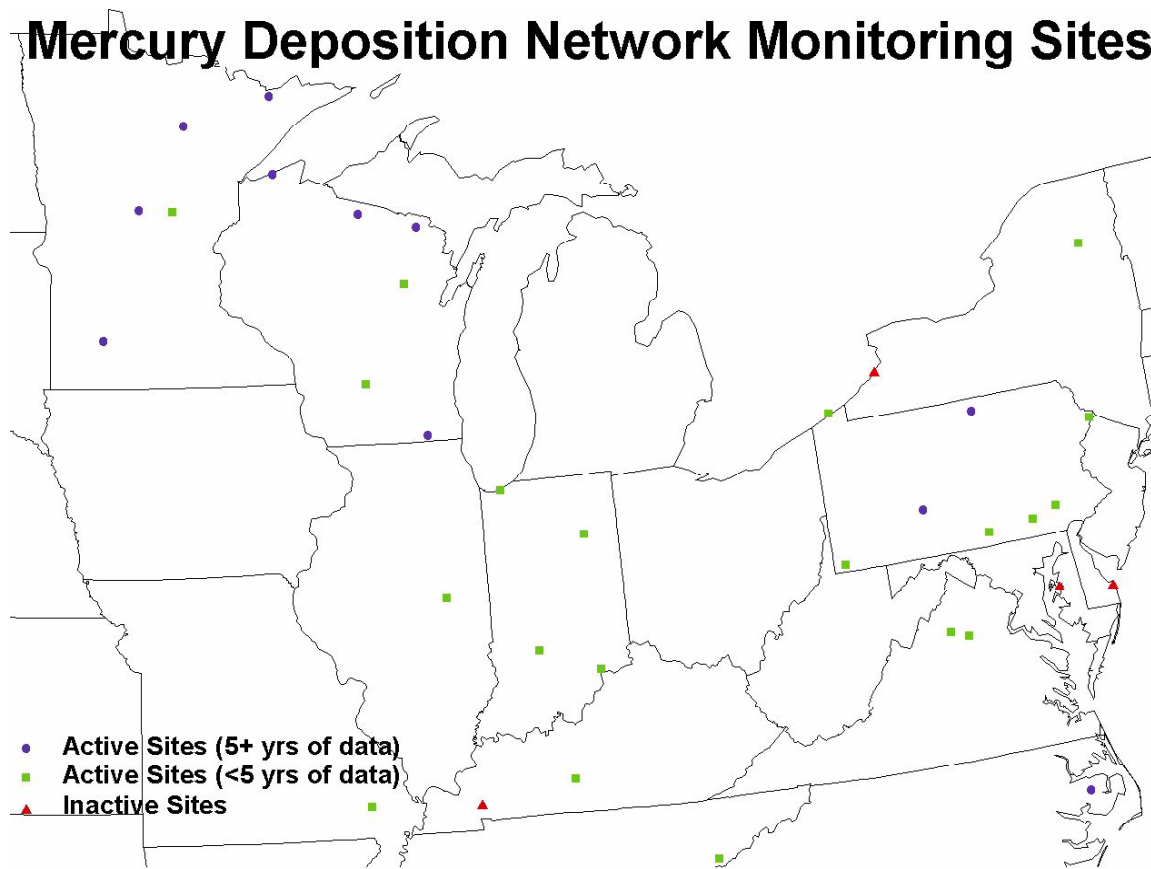
¹ For the purpose of this table, a site has a complete year of data if it has $\geq 75\%$ of the total possible number of observations for each quarter within a year (i.e., at least 10 observations in each of the 4 quarters).

Mercury Deposition Network Monitoring Sites

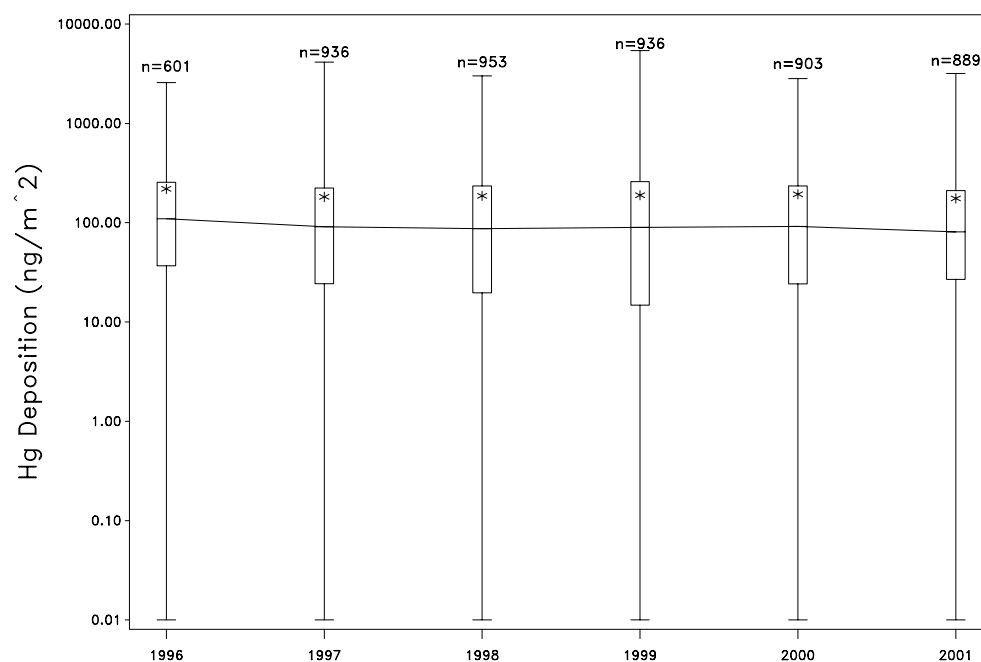


NOTE: Additionally, there are 9 active and 2 inactive monitoring sites in Canada.

Mercury Deposition Network Monitoring Sites



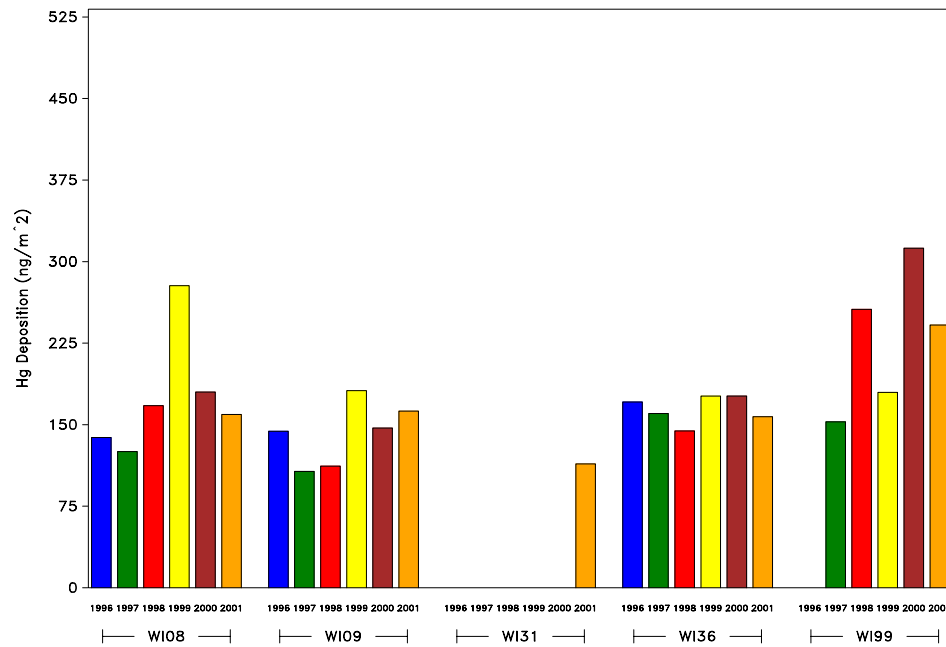
Distribution of Mercury Deposition by Year (1996–2001)



NOTE: Hg deposition values of 0 were replaced by 0.01 in order to plot on a log scale.
 NOTE: Sites with less than five years of data are excluded.

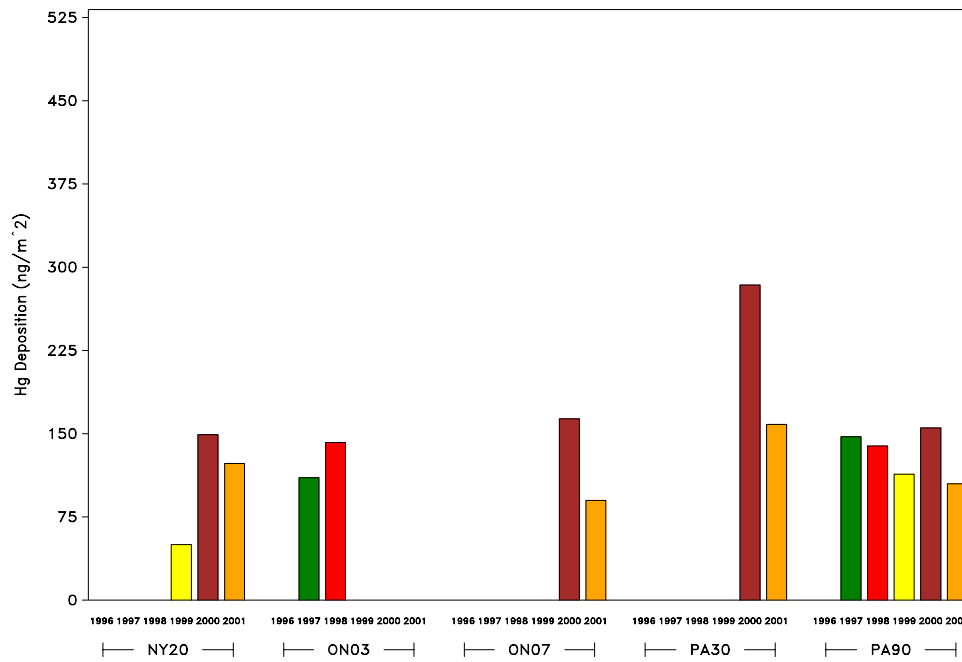
MDN Data at Great Lakes Sites

Mean Weekly Mercury Deposition by Year and Site



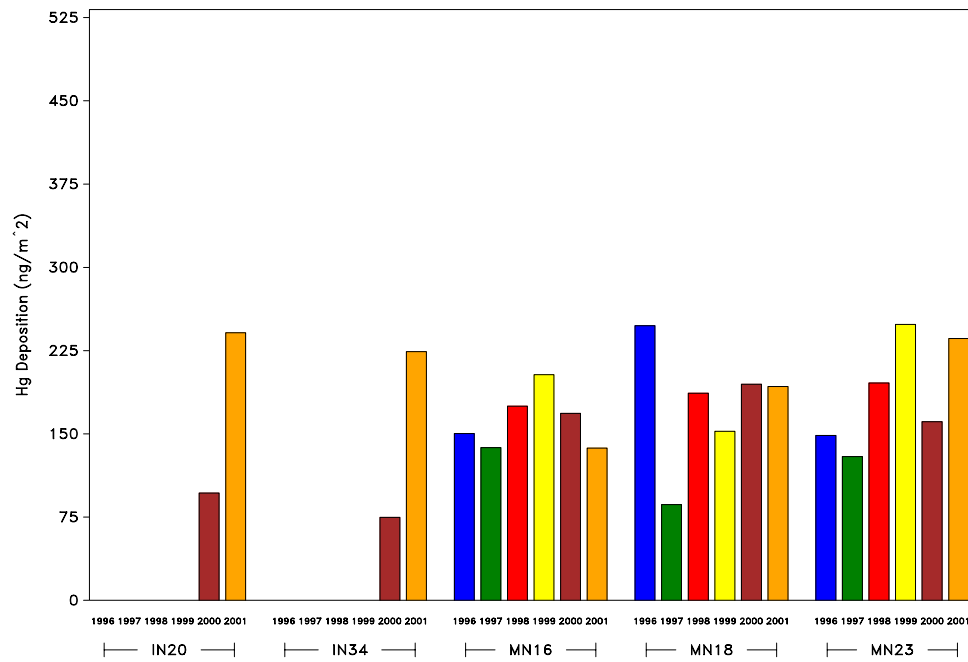
MDN Data at Great Lakes Sites

Mean Weekly Mercury Deposition by Year and Site

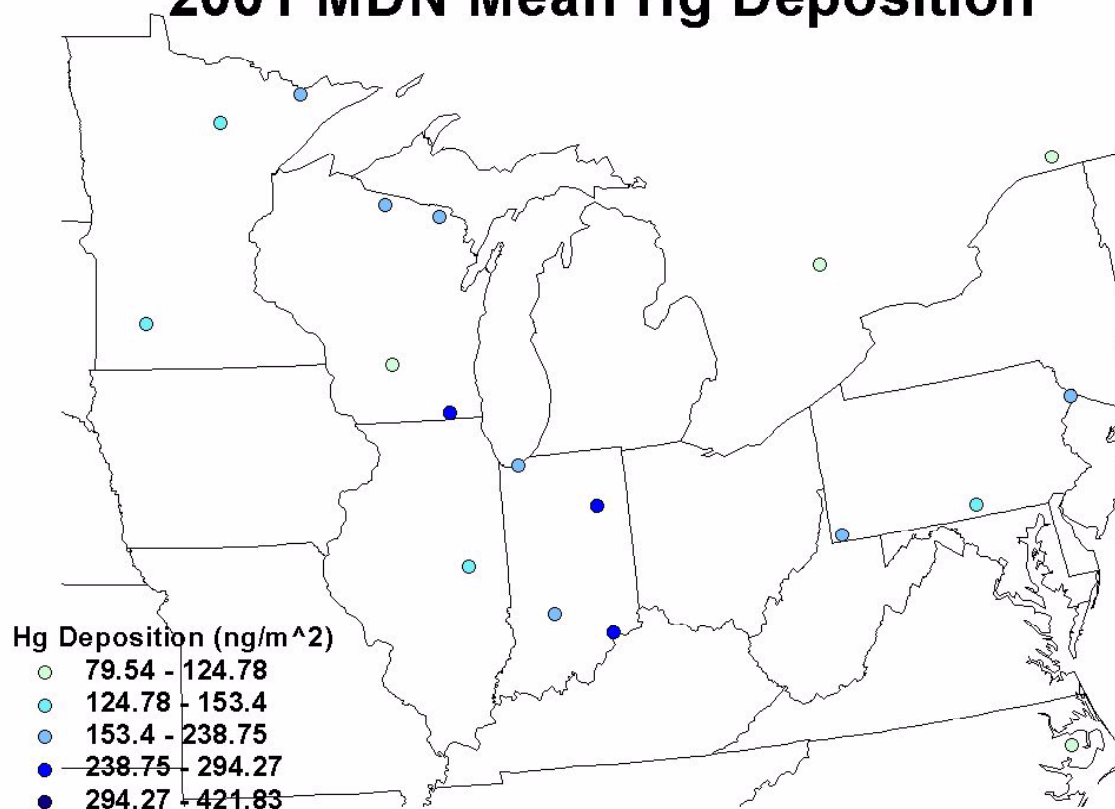


MDN Data at Great Lakes Sites

Mean Weekly Mercury Deposition by Year and Site

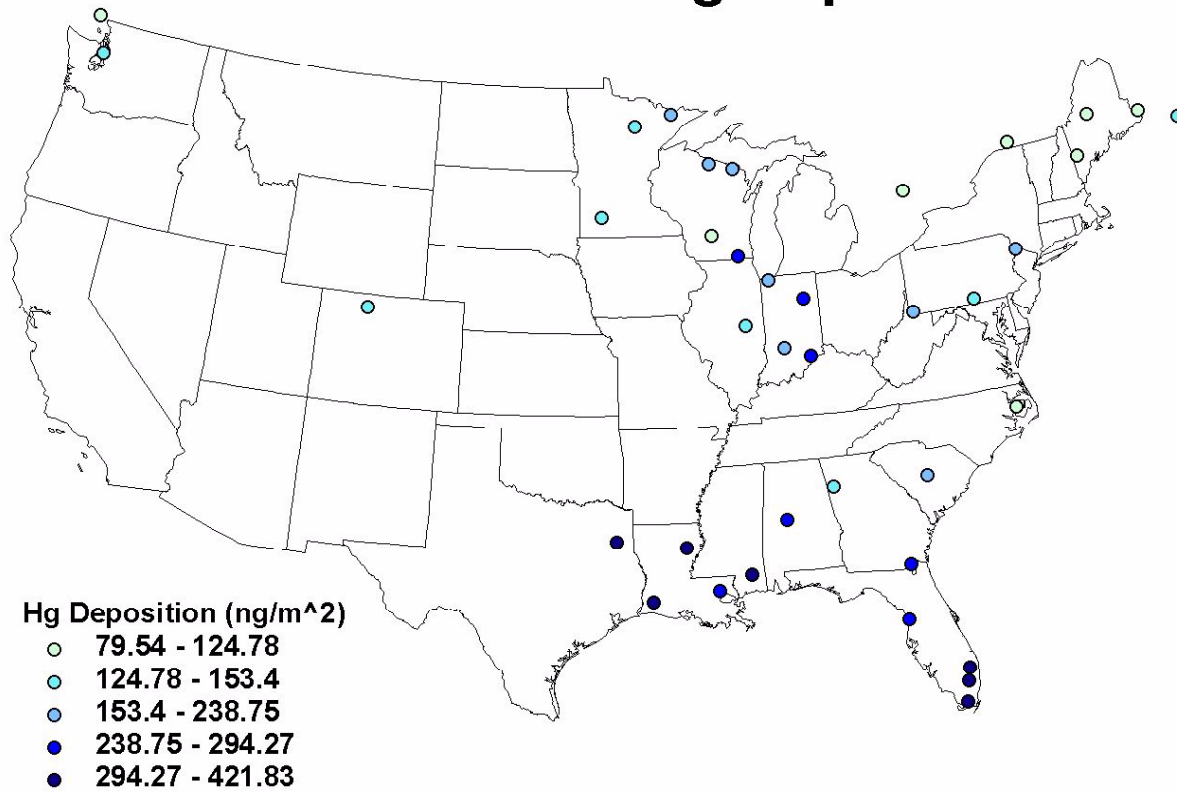


2001 MDN Mean Hg Deposition



NOTE: Map includes only those sites which have one full year of data for 2001.

2001 MDN Mean Hg Deposition

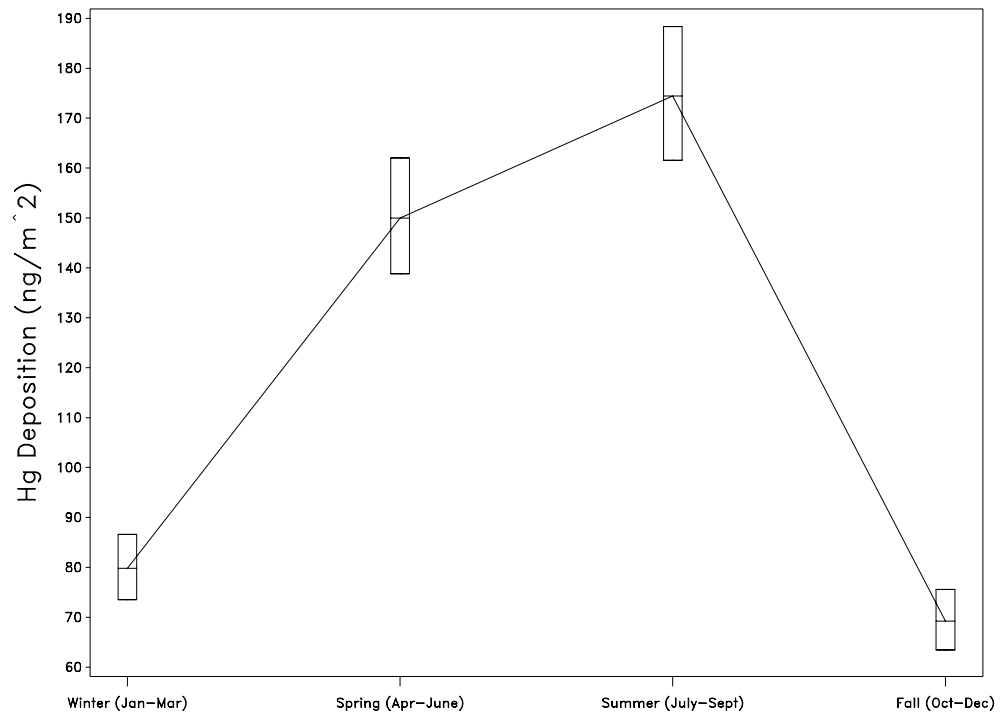


NOTE: Map includes only those sites which have one full year of data for 2001.

Seasonal Summary of MDN Data across All Sites, 1996-2001, by Quarter

Quarter (Months)	N	Quarterly Distribution of Mercury Deposition (ng/m ²)						
		Mean	Std.Dev	Min	Q1	Median	Q3	Max
Winter (Jan -Mar)	2209	122.6	176.2	0	17.5	62.2	155.6	2792.1
Spring (Apr-Jun)	2555	228.3	312.0	0	32.7	125.4	307.8	3183.7
Summer (Jul-Sep)	2749	289.3	397.8	0	46.4	159.5	372.9	5397.4
Fall (Oct-Dec)	2749	119.2	214.2	0	7.2	50.7	144.6	3277.5

Observed Seasonality of Mercury Deposition (1996–2001)



MDN Data Summary

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- 19 sites have over 5 years of data available (1996-2001)
 - Likely no discernible trend in mean weekly mercury deposition at these 19 sites, 1996-2001
 - No apparent trend in mercury deposition at 15 Great Lakes sites, 1996-2001
 - Data show seasonality of mercury deposition
 - Deposition highest during April-September, at its peak in the summer, and lowest during October-March